CBCS SCHEME

USN | | | | | | | | | | |

15EC72

Seventh Semester B.E. Degree Examination, Feb./Mar. 2022
Digital Image Processing

Time: 3 hrs. Max. Marks: 80

Note: ***Answer any FIVE full questions, choosing ONE full question from each module.***

Module-1

1 a. What is digital image processing? With the help of neat block diagram. Explain the components of a general purpose image processing system. **(10 Marks)**

b. Explain image formation in an eye. **(06 Marks)**

OR

2 a. Explain the process of image sampling and Quantization in the digital image formation. **(08 Marks)**

b. Explain spatial resolution and gray level resolution. **(04 Marks)**

c. Let p and q be two pixels at co-ordinates (10, 15) and (15, 25) respectively. Find out which distance measure give the minimum distance between pixels. **(04 Marks)**

Module-2

3 a. Explain the smoothing of images in Frequency domain using:
i) Ideal lowpass filter
ii) Butterworth lowpass filter. **(08 Marks)**

b. Explain Log transformation and Gamma transformation functions for image enhancement in the spatial domain. **(08 Marks)**

OR

4 a. Define 2-D forward and inverse discrete Fourier transform and mention its properties. **(08 Marks)**

b. With the help of a block diagram, explain homomorphic filtering approach in the image enhancement. **(08 Marks)**

Module-3

5 a. Explain any four noise probability density functions. **(08 Marks)**

b. What is order statistic filters? Explain any three of them. **(08 Marks)**

OR

6 a. What are the three methods of estimating the degradation function? Explain any two of them. **(08 Marks)**

b. Explain Weiner filtering and constrained least squares filtering in image restoration system. **(08 Marks)**

Module-4

7 a. With the help of neat diagram, explain RGB color model, and write the equations to convert RGB to CMY. **(08 Marks)**

b. What do you mean by Pseudo color image processing? And also explain Intensity to color transformations. **(08 Marks)**

OR

8 a. Explain the following :

i) Erosin
ii) Dialation
iii) Opening and closing
iv) Hit-or miss Transform. **(08 Marks)**

b. Explain boundary extraction algorithm using morphological operator. **(08 Marks)**

Module-5

9 a. What is image segmentation? Explain First-order derivatives used in edge detection. **(08 Marks)**

b. Explain the region based approach of segmentation. **(08 Marks)**

OR

10 a. Briefly explain any two types of boundary descriptors. **(08 Marks)**

b. Briefly explain any two types of regional descriptors. **(08 Marks)**

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